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ABSTRACT

The central theme of this report underlines the complexity and multifaceted problems surrounding any attempt to define relationships between special aptitudes and success in an occupation. However, relationships between special aptitudes and success in occupational training are typically more definitive and have a higher correlation. This is primarily due to the fact that training performance requires less expectations and criteria than occupational performance. This report documents the efforts of the Dutchess County Board of Cooperative Educational Services (BOCES) Area Occupational Center in developing strategies to assist young people in understanding themselves and in making adequate and satisfying decisions regarding opportunities in education and work. (Author/DEP)

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OCCUPATIONS AND APTITUDES

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Introduction

The study of personal qualities that contribute to success in occupations is one of the undeveloped areas of vocational psychology. Information such as the number and distribution of workers engaged in an occupation, promotional opportunities, earnings, duties performed, fringe benefits and the like can be ascertained objectively. However, when psychologists attempt to study the psychological factors of an occupation, the focus shifts to the human personality and the many assumptions made are rather tenuous and less than objective. Although psychologists have made significant contributions in this area, more research is needed and improved research techniques must be developed. No concurrence has been reached regarding the components of intelligence. Special abilities and other personal qualities have not been clearly defined in relationship to success in occupational performance. Furthermore, there is no current evidence that the characteristics actually necessary for successful occupational performance are the ones specified by those who do the hiring.

In the realm of the ideal situation, if the characteristics essential to success in a specific occupation can be identified and agreed upon, we will have significant information that is generally applicable, although not necessarily applicable to the individual case. Certain qualities may be considered important for a certain occupation, but individuals have and will continue to succeed in it without possessing some of these qualities. Very often the presence of strong motivation on a high level of some special ability compensates for other attributes essential to success. As educators and

guidance practioners we see the above situation actively portrayed every day when we are working with young people and in a variety of educational settings especially the regional occupational education center.

Special Aptitudes and Occupational Performance

Most of us would agree that if a person has a high degree of electronics aptitude, he should make a better electronics technician than a person who has a minimum. Thus, translated, that successful performance of the individuals work is closely related to its most central aptitude requirement. And, in general we cannot refute this assumption. But neither can we support the idea that one or even a few measurable aptitudes will predict how one will perform in an occupational area. This is truer in part because it appears that work performance is measured in different ways for different kinds of work. As Ghiselli (1966) has said, aptitudes may form a necessary but not sufficient relationship to work performance. The relationship of aptitudes to performance of different kinds of occupations is a complex one and it is further compounded by the fact that relatively diverse patterns of aptitudes are consistent with success in a particular occupation. However, there is no doubt that at least minimum aptitude requirements are important for career decision making. Posession of minimum requirements will not guarantee success in an occupation but lack of them will almost certainly guarantee difficulty or even failure.

Special Aptitudes and Occupational Training Performance

Our discussion thus far stresses the fact that our studies relating aptitudes to success in occupational performance are at best incomplete theoretical constructs which provide some information, although sketchy an vague.

However, our position at the Dutchess County BOCES Area Occupational Center is that specific aptitudes may typically correlate more highly with success in occupational training than with success in occupational performance. Reasonably speaking the latter is based upon a wider range of expectation and criteria than the former. If our position could be reasonably validated the n aptitude profiles would be most helpful in establishing minimum compentency requirements for our occupational education programs. However, this writer will be the first to categorically state that some students will succeed even though they may not meet the established minimum compentency requirements. This goes back to the beginning of our discussion that some individuals will be able to compensate for identified attributes essential to success.

Our experience with young people at the secondary level is that (1) they have very little knowledge of their aptitudes and (2) minimum information about career options and the world of work in general.

Thus, our primary reason in studying special aptitudes is to provide data that will assist students in accomplishing the two items cited above. A secondary reason but equally important is to provide data that will assist us

in the selection process for designated occupational educational programs.

After reviewing a number of aptitude tests it was decided that the Armed Services Vocational Aptitude Battery (ASVAB) be used as the principle testing element. The ASVAB was selected for a number of reasons one of which was the recommendation by the New York State Department of Education (1973) to investigate the "use of ASVAB as a predictive instrument for success in occupational training in a BOCES Area Occupational Center."

In June of 1975 the ASVAB was administered to 220 advanced students who volunteered for the norm study. All students taking the ASVAB sucessfully completed their respective two year occupational education programs and graduated high school concurrently.

At this point in our norm study we have identified two year occupational programs which seem to correlate with a number of ASVAB aptitude composites. These programs are illustrated in the following chart with the percentile mean score for each of the aptitude composites: Electronics, Motor Mechanical, General Mechanical, Clerical Administrative and General Technical.

Table 1
[Occupational Education Programs And The Resultant Mean Score For Each ASVAB - Aptitude Composite] - (Reported In Percentiles)

Occupational Education Program (2 year)	Elec.	Motor Mech.	General Mech.	Clerical Administrative	General Tech.
Business Occupations					
Data Processing	41	42	46	64	78
Dist. & Merchandising	43	50	47	45	52
Office Prac. & Mach. Acctg.	40	32	37	63	69
Trade & Tech Occupations					
Machine Shop	85	83	87	48	68
Printing & Lithography	68	71	69	40	53
Tech. Electronics	96	84	83	63	78
Agricultural Occupations					
Heavy Equipment	87	92	91	46	54
Landscape & Greenhouse Mgt.	56	68	82	61	75
Health Occupations					
Licensed Prac. Nursing	42	43	44	60	65
Service Occupations					
Auto Body Repair	72	86	81	47	49
Auto Mechanics	86	94	82	37	71
Cosmetology	46	38	57	68	61
Sm. Engine Repair	81	84	83	36	51
Const Occupations					
Air Cond. & Ref.	82	77	88	52	55
* Bldg. Trades Spec.	54	70	72	52	64
Carpentry/Bldg. Const.	70	67	89	38	72
Masonry	57	60	67	30	34
Plumbing/Heating	72	75	69	37	54
Trade Elec.	97	86	89	54	68

* One Year Occupational Program (advanced type)

At first glance, we could immediately begin to make some tentative assumptions and speculations about the relationship of data in the previous chart. However, we must be careful not to speculate until there is more conclusive data. For example one consideration requiring further study is the relationship of certain occupational programs to the minimum percentile score of a special aptitude composite.

TABLE 2

(Correlations Between Selected Occupational Education Programs And The Minimum/Maximum Percentile Scores Of Identified Aptitude Composites)

(Toward A Relationship Analysis)

OCCUPATIONAL EDUCATION PROGRAM	APTITUDE COMPOSITE	MINIMUM SCORE	MAXIMUM SCORE
Air Conditioning/ Refrigeration	Electronics	50	95
	Motor Mechancial	55	99
	General Mechanical	78	99
Auto Body Repair	Motor Mechanical	50	97
	General Mechanical	60	96
Auto Mechanics	Electroncis	59	96
	Motor Mechanical	84	99
	General Mechanical	55	98
Building Specialties	Motor Mechanical	51	77
	General Mechanical	53	89
Carpentry/Building Construction	General Mechanical	62	89
	General Technical	51	91
Data Processing	Clerical-Administrative	51	82
	General Technical	55	94

TABLE 2 continued

OCCUPATIONAL EDUCATION PROGRAM	APTITUDE COMPOSITE	MINIMUM SCORE	MAXIMUM SCORE
Heavy Equipment	Electronics	60	99
	Motor Mechanical	70	99
	General Mechanical	55	99
Machine Shop	Electronics	81	98
	Motor Mechanical	60	99
	General Mechanical	71	99
Printing & Lithography	Electronics	56	98
	Motor Mechanical	57	96
	General Mechanical	60	94
Small Engine Repair	Electronics	56	96
	Motor Mechanical	70	99
	General Mechanical	65	98
Technical Electronics	Electronics	93	98
	Motor Mechanical	62	95
	General Mechanical	60	99
	General Technical	55	94
Trade Electricity	Electronics	59	99
	Motor Mechanical	84	92
	General Mechanical	55	97

The data contained in the foregoing tables and additional information resulting from the 1975 test groups has raised many questions which need additional study before decisions can be made about the usefulness of ASVAB in relating to occupational training performance.

Performance Based Vocational Evaluation

The Area Occupational Center does not feel that paper and pencil tests are the only answer for the assessment of student achievement. In fact it is our opinion that performance testing is more relevant for many activities in occupational education and for certain student populations.

Thus in the fall of 1975 we opened the doors of our Vocational Evaluation Center (VEC). The program at the (VEC) is a performance based evaluation system involving step by step completion of programmed work tasks performed sequentially at a series of work sample evaluation stations. The program design provides information and experiences for students which will help lead them to a logical selection of a specific occupational education training program. The activities performed in a simulated work setting, reflect the primary factors inherent in actual jobs.

A battery of work stations, arranged in a hierarchy of increasing complexity, allows for evaluation of performance, interest, and work behavior. The work sample stations are equipped with hand tools and programmed with audio-visual input to transmit instruction. The student is evaluated by rating his performance at work tasks assigned to each station. Results are directly related to worker groups in the Dictionary of Occupational Titles.

The performance assessment permits a student to actually use tools and create some type of object, or carry out a series of job tasks. At the end of such an experience, a student can easily see how well he did.

The teacher evaluator can give him an objective assessment pointing out any errors he has made. This kind of feedback is very different from what one would receive from the traditional paper and pencil type test.

Students will be oriented to the concept of work and its physical, social and emotional implications. Some of the occupations included in the work sample evaluation are: basic tools, bench assembly, drafting, electrical wiring, metal working, health services, plumbing, carpentry, air conditioning, cooking and baking, small engine repair, welding, office and sales, masonry and cosmetology.

Approximately 30 - 40 hours are required for the student to complete the work sample evaluation stations.

Our evaluation plan for the program will include a comparison study of the success rate of the VEC student group with other groups not involved in the vocational evaluation project.

Summation

The central theme of this report underlines the complexity and multi-faceted problems surrounding any attempt to define relationships between special aptitudes and success in an occupation. However, relationships between special aptitudes and success in occupational training are typically more definitive and have a higher correlation. This is primarily due to the fact that training performance requires less expectations and criteria than occupational performance. This report documents the efforts of the Dutchess County BOCES Area Occupational Center in developing strategies to assist young people in understanding themselves and in making adequate and satisfying decisions regarding opportunities in education and work.

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